

STARTING AND LIGHTING SYSTEM TROUBLES DUE TO MISUNDERSTANDING

DIAGRAM OF WIRES CLEARS AWAY MANY KNOTTY PROBLEMS

First Difficulties Detected
By Close Watch on
Meter.

NEEDS QUICK ACTION

Frequent Inspection of All
Wires Helps Keep Car
In Order.

Trouble in the starting and lighting system is something that fills the soul of the average car owner with dread. Yet a careful look at the wiring diagram of his car will serve to unravel most difficulties, especially if he understands a few basic principles, which we purpose explaining in this story.

The electric starting and lighting system of the car usually consists of a generator and starting motor, either separate or included in a single unit; a storage battery which is charged by the generator and then feeds its current to the starting motor and to the lamps. Then there is a cutout which connects and disconnects the generator to or from the battery at slow engine speeds, and there is also a device to regulate the charging rate to conform to the service usually demanded of the car. These with various wires, switches, lamps, etc., complete the system.

To begin with, there is mounted on the dash of the modern car a meter of some type to register the charge and discharge of the battery, so that the driver can tell how the starting and lighting system is functioning. When the starting pedal is depressed the meter begins to register discharge because the battery is being drawn upon for current to turn the starting motor over. Sometimes the meter gets out of order. When the motor is not running and when the lights are not burning the hand of the meter should register zero. If it does not so register the hand is bent or the magnet of the instrument may be weak or the return spring may not be strong enough. If the error is more than a trifling one the meter should be inspected internally. Vibration and excessive voltage sometimes cause derangement in these meters, and in this case the car owner had better take the instrument to the service station.

Wear in Bearings.
It is not often that mechanical troubles afflict the starting and lighting system. Wear in the bearings of the generator and starting motor is the commonest mechanical ill. Sometimes there is trouble in the linkage or in the governor. With these troubles the car owner can cope just as easily as he can on other parts of the mechanism.

Electrical troubles obviously are among the commonest that occur in this system and they are mostly caused by open circuits or shorts. In the former case there will be no flow of current at all, while in the latter the flow will be in the wrong direction where the actual work of the system is slighted, as when one uncovered wire touches another on a different circuit.

Need of Inspection.
It is necessary to inspect the entire wiring system at frequent intervals, because open circuits and shorts are likely to occur at any time. The chafing through of the insulation of a wire is enough to prevent the current from flowing in the place where it is needed. Constant vigilance is the price of starting and lighting efficiency.

There are two methods of running the wires from the battery to the lamps, etc., known respectively as single and double wiring. In the double wiring system two wires are used, one to carry the current to its place, where it is needed, and another to bring it back to the battery. In the single wire system one wire carries the current out, while the return is accomplished through the metal of the car's frame. If the wire of a single wire system is stripped of its insulation and touches the metal of the car a short circuit is established and the part served by that wire will not operate at all; if it is a lamp it will not burn. In the two wire system a short does not form so easily, as two wires must be out of business to cause it.

Trouble in Terminals.
The terminals are a source of great trouble in this system. One poor terminal connection may put the whole system out of order, or it may simply prevent one of the lights from working properly. In case of trouble inspect these parts.

If the starting motor does not

Arranges Haynes Shipment



WILLIAM E. PHELPS.

General sales manager of the Haynes Corporation (on left) who has been in Washington for several days conferring with William Lininger, general manager of the District Haynes Corporation (on right) with regard to a trainload shipment of Haynes Fifty's to this city.

turn the engine over snappily and if the lights do not burn with due radiance the trouble is probably caused by the battery. If the lamps do not burn properly but the starter seems to be working all right obviously the lighting end of the system should be inspected. The best way to attack the matter is to begin at one end of the line and work right down to the other. Start at the bulbs and work back to the battery, examining on the way.

Bulbs Burned Out.
Sometimes the trouble will be found right in the bulbs, which have burned out or have suffered broken filaments through excessive vibration, though this will seldom happen to two bulbs at once. The connectors that lead to the lamps may be loose or the contact points may be corroded. Next examine the wiring back to the switch. See that all wires are fully insulated. In a one wire system see that that wire is fastened to the metal to which it is attached. In cases where a function box is used there may be a short in this box or the connection here may be loose or dirty. If there are fuses in the wire a fuse may have blown out or the fuse connection may be poor or corroded. If after installing a new fuse that blows out the trouble is in the system. The fuse is intended to protect the system in general from the effects of excessive current supply. Some systems employ circuit breakers instead of fuses.

Dirt in Switches.
Switches are another seat of trouble, through dirt, looseness, poor adjustment, etc. Every switch should be inspected in case of trouble. Most starting and lighting systems today include a cutout which disconnects the battery from the generator circuit when the engine is running slowly, usually at ten miles an hour or less. The ordinary form is electro-magnetically operated and the magnetic points should be kept clean. The cutout terminals, if they become dirty or loose, will cause trouble. If the cut-out does not operate properly undercharging may result with battery ill in consequence. Finally, it is best to use a wiring diagram of the car in hunting for trouble, so that each circuit may be carefully followed from end to end. If the owner has not a diagram it will be supplied by the car manufacturer or the nearest service station.



"Need any help, Doctor?"

"Yes! I need that LEE Puncture-proof Cord—I've had two punctures already—and must get there—sure"



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CAR OWNERS PAY \$267,000,000 IN 'STIGMA TAXES'

New Booklet Shows Toll
Levied by U. S. and
Asks Law's Repeal.

Motorists who desire to know how much the car-owning public pays in special taxes can find the information in a new booklet "National Taxation Policy" issued by the National Automobile Chamber of Commerce.

Two hundred and sixty-seven million dollars is the total special tax paid by motorists annually. This does not include the regular personal property, excises, license, income or other taxes to which the car owner may be subject. Because these are special taxes of a class levied before the war only on such products as alcoholic liquors, narcotics, or murderous weapons, the booklet characterizes these levies as "stigma taxes." It asks their repeal on all legitimate products such as musical instruments, motion pictures, and jewelry, which are now specially taxable under the war revenue laws.

The pamphlet is a summary of the presentation of the automobile tax situation by C. C. Hanch and George M. Graham before the Senate Finance Committee on May 16. Mr. Hanch, chairman of the N. A. C. C. taxation committee, recognizes that there can be no lowering of taxes without readjustment of the budget and at Washington suggested a constructive program on economic grounds. Mr. Graham discussed the aid to the farmer and to general business which would result from reduction of taxes on motor transport.

Rubber Solvent.
Only pure unvulcanized rubber is soluble. However, if the pure rubber is shredded into small particles and covered with mineral naphtha or pure benzole, it will be reduced to a gelatinous liquor. In case a quick drying solution is desired, carbon disulphide should be used as a solvent.



Pays for Black Beauty. Pay while you ride. Built in our own factory, sold to you at factory prices. Guaranteed 5 years. We save you dealers' profit. Special for this week, \$60.00 Lenawee Motor Bike, \$39.95. Everything for the bike 10 to 20 per cent off.



With the reduction of \$60 you cannot now afford to be without this wonderful 4-cylinder, Acc. 20 H. P., made like a high-price car, cheaper than a 2-cylinder. Our easy payment plan will enable you to own one. We have some good used machinings of all makes we are closing out at a very low price on easy payments.

Haverford Cycle Co.
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Chalmers Special Good After Eleven Years of Racing

A 1916 model special speedster Chalmers, owned by G. F. Woods, of Little Rock, Ark., has had a hard and a widely varied career during its eleven years of service.

It was originally the property of Eddie Bingham, the famous race driver, and has "performed" in the Virgin, Ill., road races and on the Pensacola, Fla., speedway, to say nothing of "harnaspeeding" all over the country. At another time, it was a scout car on the Lincoln Highway.

When questioned about the car, Mr. Woods said: "She is some boat and she has some record, too. Had some pretty tough grinds but she's

still good. Guess she'll make about 35 or more per hour. She has probably gone way over 100,000 miles but she's good for at least 50,000 more. The original factory rings and pistons are still in the motor and are in good condition. The cylinders are not scored and have never been rebored."

Mr. Woods was at one time mechanic for E. J. Kilpatrick.

Gas for Twenty Years.

According to figures from the United States geologic survey, there are 3,000,000,000 barrels of crude oil in the fields in the United States, or enough to supply this country with "gas" for the next 20 years.

Motor Postal Service.

Motor vehicle service for the transportation of United States mails is now established in 163 cities. There are 839 rural routes using cars or trucks.

De Palma to Race European Demons In the Grand Prix

Ralph De Palma, who proved the sensation of the recent international sweepstakes race at Indianapolis by making the pace in his speedy Good-year-equipped French Ballot car until he broke a connecting rod in the 170th mile, is on the high seas en route for France to drive in the Grand Prix next month.

The popular driver will captain the Ballot team in the famous Le Mans road contest, and his admirers both in America and in Europe believe he will give the stars of two continents the race of their lives.

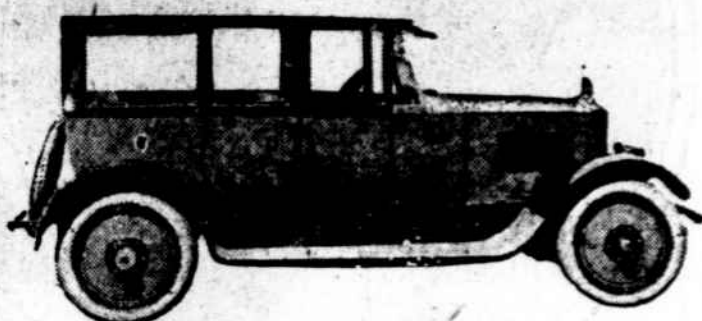
De Palma has no peer as a road race pilot in America, and few, if any, abroad. He will be pitted against such brilliant drivers as Guyot, who

won the 1921 race on the island of Sicily, probably the most famous course in the world; Rene Thibault, veteran of many Grand Prix contests; Andre Bollot, idol of French race fans, and Dario Resta, winner of the 1916 Indianapolis classic. While Americans would like to see the Duesenberg cars of the Stars and Stripes to victory, these will be thousands in the United States who will glory in a win for De Palma, even though he will be at the wheel of a foreign machine.

Sealing Wax Paint.

Melt small pieces of sealing wax in alcohol. The wax should be covered with the liquid and be left for a day or two, when it will be found to have become about the consistency of varnish. When used this compound is applied as a paint. It dries fairly quickly and is acid proof which makes it favorable for use on terminals, connecting bars and other battery fittings.

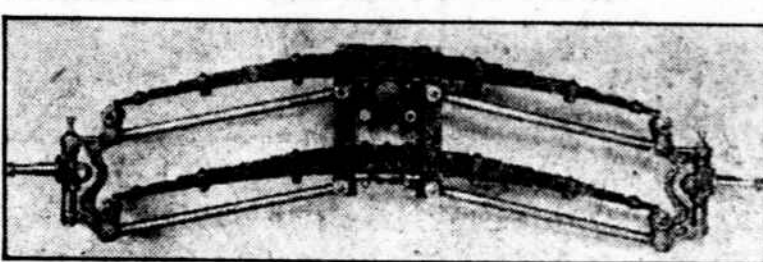
THE BIRMINGHAM No-Axle Car



IS SATISFYING A CRITICAL PUBLIC
BECAUSE

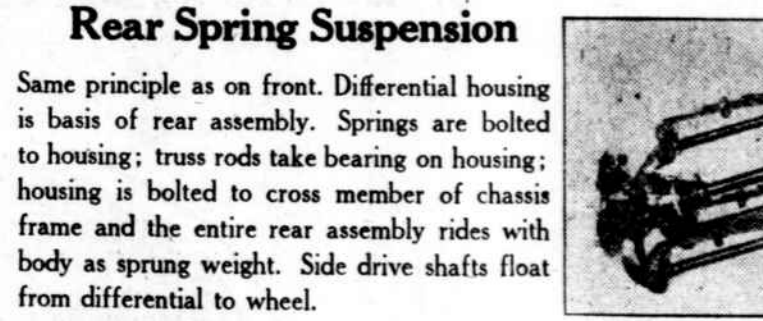
It is proving itself to be the easiest of easy-riding cars, regardless of make or style of construction. As handsome as the best on the market, economical of operation and maintenance.

An Easily Handled Car



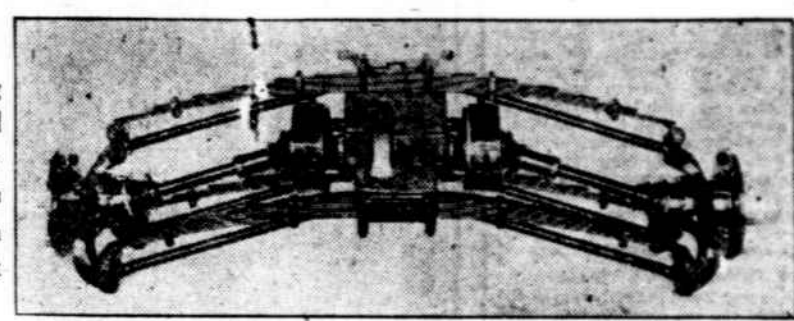
Front Spring Suspension

Springs bolted to center plate, each end being supported by shackles on the rods. Truss rods take stress and strain off springs and hold wheels in vertical position at all times. Flexing of springs permit each wheel to absorb shocks of road with practically no effect on car or passengers in car. Steering arrangement is standard as on any car.



Rear Spring Suspension

Same principle as on front. Differential housing is basis of rear assembly. Springs are bolted to housing; truss rods take bearing on housing; housing is bolted to cross member of chassis frame and the entire rear assembly rides with body as sprung weight. Side drive shafts float from differential to wheel.



This revolutionary improvement in car construction, engineered and developed to the highest state of perfection by master minds in the automotive industry, is exciting the interest of the entire automotive world.

This model car left the plant of the Developing Engineers in Detroit, May 9, 1921, headed for points in Pennsylvania and New York, with the President of the Company, Hon. Samuel A. Carlson, Mayor of Jamestown, N. Y.; George B. Mechem, the Financial Agent of the Company; C. E. Weaver, General Manager, and James A. Wright, Chief Engineer, as passengers. In Erie, demonstration rides were given over rough cobblestone streets at 35 and 40 miles per hour that other cars ordinarily covered at 5 miles or less. Solid axle cars were driven over this type of street in Erie at best safe speeds of 19, 21 and 25 miles per hour, and the drivers refused to drive faster.

The Birmingham Car has since been driven over prepared roadways of logs and timbers, spaced 4 to 6 feet apart, at 18 to 20 miles per hour without hurting the car or giving undue shock to passengers.

On the country roads, traveling across country on an average of 300 miles a day, The Birmingham is daily proving its superior riding qualities—the easiest of riding cars on the road.

It is now averaging 18 miles per gallon of gas and 700 miles per quart of oil. The tires, after over 8,000 miles of the roughest driving, have just begun to show wear, indicating that we will get better than 20,000 miles from a set of tires.

A CAR THAT IS—

The easiest riding on wheels.
Economical to maintain and operate.
As handsome as the best.
Appealing strongly to the public.
WILL IT SELL? WE KNOW IT WILL! YOU KNOW IT WILL, for you will want one of these cars yourself.
An investment in Birmingham Motors stock will permit you to participate in the profits from the sale of this car.

LOOK INTO THIS—DO IT NOW!
Stock selling at \$20.00 per share in minimum blocks of 5 shares. Each block carries a contract which returns to you out of first profits of the Company the amount of money you invest, leaving your stock intact.
Information at local office.

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